



## Complete Summary

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### **GUIDELINE TITLE**

Node-positive prostate cancer.

### **BIBLIOGRAPHIC SOURCE(S)**

Lawton CA, Roach M III, Anscher MS, Beyer DC, Lee WR, Merrick G, Michalski JM, Pollack A, Vijayakumar S, Carroll PR, Higano CS, Mauch PM, Expert Panel on Radiation Oncology-Prostate Work Group. Node-positive prostate cancer. [online publication]. Reston (VA): American College of Radiology (ACR); 2006. 6 p. [41 references]

### **GUIDELINE STATUS**

This is the current release of the guideline.

This guideline updates a previous version: McCormick B, Mendenhall NP, Shank BM, Haffty BG, Halberg FE, Martinez AA, McNeese MD, Mitchell SE, Rabinovitch RA, Solin LJ, Taylor ME, Singletary SE, Leibel S. Local regional recurrence and salvage surgery. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):1181-92.

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

## **COMPLETE SUMMARY CONTENT**

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## **SCOPE**

### **DISEASE/CONDITION(S)**

Node-positive prostate cancer

**GUIDELINE CATEGORY**

Treatment

**CLINICAL SPECIALTY**

Internal Medicine  
Oncology  
Radiation Oncology  
Radiology  
Surgery

**INTENDED USERS**

Health Plans  
Hospitals  
Managed Care Organizations  
Physicians  
Utilization Management

**GUIDELINE OBJECTIVE(S)**

To evaluate the appropriateness of radiologic treatment procedures for patients with node-positive prostate cancer

**TARGET POPULATION**

Patients with node-positive prostate cancer

**INTERVENTIONS AND PRACTICES CONSIDERED**

1. Radiation therapy with hormonal treatment
2. Hormonal treatment alone
3. Radiation to pelvis and prostate
4. Radical prostatectomy with hormonal treatment
5. Radical prostatectomy alone
6. Radiation to prostate only
7. Consideration of radiation dose, treatment plan, and blocking

**MAJOR OUTCOMES CONSIDERED**

- Disease-free, cause-specific, and overall survival rates
- Local and distant control rates

**METHODOLOGY****METHODS USED TO COLLECT/SELECT EVIDENCE**

Searches of Electronic Databases

## **DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE**

The guideline developer performed literature searches of peer-reviewed medical journals and the major applicable articles were identified and collected.

## **NUMBER OF SOURCE DOCUMENTS**

The total number of source documents identified as the result of the literature search is not known.

## **METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE**

Weighting According to a Rating Scheme (Scheme Not Given)

## **RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE**

Not stated

## **METHODS USED TO ANALYZE THE EVIDENCE**

Systematic Review with Evidence Tables

## **DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE**

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

## **METHODS USED TO FORMULATE THE RECOMMENDATIONS**

Expert Consensus (Delphi)

## **DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS**

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed for reaching agreement in the formulation of the appropriateness criteria. The American College of Radiology (ACR) Appropriateness Criteria panels use a modified Delphi technique to arrive at consensus. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table and narrative as developed by the topic leader(s). Questionnaires are completed by participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1-9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty percent agreement is considered a

consensus. This modified Delphi technique enables individual, unbiased expression, is economical, easy to understand, and relatively simple to conduct.

If consensus cannot be reached by the Delphi technique, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible. If "No consensus" appears in the rating column, reasons for this decision are added to the comment sections.

## **RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS**

Not applicable

## **COST ANALYSIS**

A formal cost analysis was not performed and published cost analyses were not reviewed.

## **METHOD OF GUIDELINE VALIDATION**

Internal Peer Review

## **DESCRIPTION OF METHOD OF GUIDELINE VALIDATION**

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

## **RECOMMENDATIONS**

### **MAJOR RECOMMENDATIONS**

**ACR Appropriateness Criteria®**

**Clinical Condition: Node-Positive Prostate Cancer**

**Variant 1: 72-year-old male. Microscopic metastasis in a single lymph node following radical prostatectomy. Negative margins.**

<b>Treatment</b>	<b>Appropriateness Rating</b>	<b>Comments</b>
Radiation therapy with hormonal treatment	7	
Hormonal treatment alone	6	
Radiation to pelvis and prostate bed	5	

<b>Treatment</b>	<b>Appropriateness Rating</b>	<b>Comments</b>
Radiation to prostate bed only	2	
<b>Pelvic Radiation Dose</b>		
4500/25 fractions	6	
5040/28 fractions	7	
5400/30 fractions	2	
<b>Prostate Bed Dose</b>		
4500/25 fractions	2	
5940/33 fractions	6	
6660/37 fractions	7	
<b>Treatment Plan</b>		
3D CT-based plan	7	
IMRT	7	
2D CT-based plan	6	
Non-CT based computerized plan	5	
<b>Blocking</b>		
Complex block	6	
Hand block	5	
Open field	3	
<b><i>Appropriateness Criteria Scale</i></b> <b>1 2 3 4 5 6 7 8 9</b> <b>1 = Least appropriate 9 = Most appropriate</b>		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

**Variant 2: 55-year-old male. Grossly involved pelvic lymph nodes before planned prostatectomy.**

<b>Treatment</b>	<b>Appropriateness Rating</b>	<b>Comments</b>
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<b>Treatment</b>	<b>Appropriateness Rating</b>	<b>Comments</b>
Radiation therapy with hormonal treatment	7	
Hormonal treatment alone	6	
Radiation to pelvis and prostate	6	
Radical prostatectomy with hormonal treatment	3	
Radical prostatectomy alone	2	
Radiation to prostate only	2	
<b>Pelvic Radiation Dose</b>		
4500/25 fractions	6	
5040/28 fractions	7	
5400/30 fractions	2	Additional radiation boost to the area of the involved lymph nodes is acceptable
<b>Prostate Dose</b>		
7020/39 fractions	7	
7560/42 fractions	7	
5940/33 fractions	2	
6660/37 fractions	6	
<b>Treatment Plan</b>		
IMRT	7	
2D CT-based plan	6	
3D CT-based plan	5	
Non-CT based computerized plan	4	
<b>Blocking</b>		
Complex block	6	

<b>Treatment</b>	<b>Appropriateness Rating</b>	<b>Comments</b>
Hand block	5	
Open field	2	
<b><i>Appropriateness Criteria Scale</i></b> <b>1 2 3 4 5 6 7 8 9</b> <b>1 = Least appropriate 9 = Most appropriate</b>		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

**Variant 3: 67-year-old male. PSA of 30. CT-guided fine needle biopsy of pelvic lymph node reveals metastatic adenocarcinoma.**

<b>Treatment</b>	<b>Appropriateness Rating</b>	<b>Comments</b>
Radiation therapy with hormonal treatment	8	
Radiation to pelvis and prostate	7	
Hormonal treatment alone	6	
Radical prostatectomy with hormonal treatment	3	
Radical prostatectomy alone	2	
Radiation to prostate only	2	
<b>Pelvic Radiation Dose</b>		
4500/25 fractions	6	
5040/28 fractions	7	
5400/30 fractions	2	Additional radiation boost to the area of the involved lymph nodes is acceptable.
<b>Prostate Dose</b>		
5940/33 fractions	2	
6660/37 fractions	6	

<b>Treatment</b>	<b>Appropriateness Rating</b>	<b>Comments</b>
7020/39 fractions	7	
7560/42 fractions	7	Still needs local control, could give higher dose.
<b>Treatment Plan</b>		
3D CT-based plan	7	
IMRT	7	
2D CT-based plan	6	
Non-CT based computerized plan	4	
<b>Blocking</b>		
Complex block	8	
Hand block	6	
Open field	2	
<b><i>Appropriateness Criteria Scale</i></b> <b>1 2 3 4 5 6 7 8 9</b> <b>1 = Least appropriate 9 = Most appropriate</b>		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Histologically proven lymph node metastasis from adenocarcinoma of the prostate portends a poor prognosis. With the widespread use of PSA screening, 90% of all prostate cancers are discovered in the local and regional stages. Thus approximately 10%-20% of patients present with locally advanced disease, many of whom have positive regional lymph nodes. The optimal treatment of these node-positive patients remains controversial; recommendations range from immediate hormonal treatment to aggressive combined modality approaches.

Given the variable natural history of prostate cancer, several investigators have examined histologic variables that can predict ultimate prognosis. Recent investigations have examined immunohistochemical variables (p53 alterations, human glandular kallikrein 2) that are detectable in metastatic lymph nodes as potential prognostic factors. The available data indicate that both the number of involved nodes and the extent of metastatic involvement are predictive of subsequent disease progression. The few series with long follow-up, however, indicate that even patients with minimal microscopic lymphatic metastases have poor long-term disease-free survival with most patients developing metastatic disease by 10 years following treatment.



In the absence of some form of adjuvant hormonal therapy, radical local or locoregional therapy (radical prostatectomy plus lymph node dissection or radiotherapy) has resulted in ten-year survivals of only 20%-30% with nearly all patients developing evidence of distant metastasis within ten years of diagnosis. Series of patients treated with early androgen ablation show similar results. The best results reported in node-positive patients are from series that combined a local or locoregional modality (surgery or radiation) with early adjuvant hormonal therapy.

Many of the series reported above include patients treated before the widespread availability of PSA to monitor patients following treatment. The few series for which post-treatment PSA levels are available show much lower rates of disease-free survival if PSA is used to define the absence of disease.

A randomized trial found an overall survival benefit for immediate androgen deprivation following prostatectomy for men with node-positive disease. This study was rather small (98 men), never achieved its projected goal of 240 men, and did not require central pathologic review. Furthermore, disease-free survival in the control arm was lower than that reported in several single-institution series of radical prostatectomy alone. Although this study suggests an advantage for early androgen-deprivation, further studies with larger numbers of patients will be required. Two other prospective randomized series of node-positive prostate cancer patients have been reported recently. In the first study, the subset of pathologically positive lymph node patients showed a clear overall survival advantage with the addition of hormone therapy to definitive radiation therapy. In the data from the first study, the subset of pathologically positive lymph node patients showed a clear overall survival advantage with the addition of hormone therapy to definitive radiation therapy. Each endpoint from PSA—local control, distant disease, cause specific, and overall survival was positively impacted by the use of hormone therapy over radiation alone for the node—positive patients in that trial. In addition, the second study, for which patients were randomized between whole pelvic and prostate only irradiation in addition to neoadjuvant vs adjuvant therapy, showed an advantage to patients with whole pelvis radiation therapy and neoadjuvant hormonal manipulation in terms of progression-free survival for patients who had a risk of lymph node involvement >15%.

The natural history of treated patients with node-positive prostate cancer indicates that a large proportion of men will develop distant metastases by within ten years of treatment. Recent molecular staging methods suggest that a majority of patients with node-positive prostate cancer harbor occult distant metastatic disease at the time of diagnosis. One author has published his experience in 55 men with prostate cancer in whom bone aspirates were examined by reverse transcriptase polymerase chain reaction (RTPCR) and immunohistochemical techniques to identify metastatic prostate cancer cells. It was reported that more than 70% of men with lymphatic metastases and a negative bone scan had evidence of metastatic cancer cells in the bone marrow.

If these node-positive patients do in fact have micrometastatic distant disease, any local modality is doomed to failure. Treatment strategies designed to cure patients with node-positive prostate cancer should include a systemic component in addition to aggressive locoregional therapy.

Recent studies suggest that comprehensive pelvic nodal radiotherapy may be best accomplished by using IMRT. This approach results in better coverage of nodal areas and less dose to adjacent tissues such as the bladder, rectum, and penis.

### **Abbreviations**

- 2D-CT two-dimensional computed tomography based plan
- 3D-CT, three-dimensional computed tomography based plan
- CT, computed tomography
- IMRT, intensity modulated radiotherapy
- PSA, prostate-specific antigen

### **CLINICAL ALGORITHM(S)**

Algorithms were not developed from criteria guidelines.

## **EVIDENCE SUPPORTING THE RECOMMENDATIONS**

### **TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS**

The recommendations are based on analysis of the current literature and expert panel consensus.

## **BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS**

### **POTENTIAL BENEFITS**

Selection of appropriate radiologic procedures for management of patients with node-positive prostate cancer

### **POTENTIAL HARMS**

Not stated

## **QUALIFYING STATEMENTS**

### **QUALIFYING STATEMENTS**

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate

imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

### IMPLEMENTATION TOOLS

Personal Digital Assistant (PDA) Downloads

For information about [availability](#), see the "Availability of Companion Documents" and "Patient Resources" fields below.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Getting Better  
Living with Illness

### IOM DOMAIN

Effectiveness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Lawton CA, Roach M III, Anscher MS, Beyer DC, Lee WR, Merrick G, Michalski JM, Pollack A, Vijayakumar S, Carroll PR, Higano CS, Mauch PM, Expert Panel on Radiation Oncology-Prostate Work Group. Node-positive prostate cancer. [online publication]. Reston (VA): American College of Radiology (ACR); 2006. 6 p. [41 references]

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

1996 (revised 2006)

## **GUIDELINE DEVELOPER(S)**

American College of Radiology - Medical Specialty Society

## **SOURCE(S) OF FUNDING**

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

## **GUIDELINE COMMITTEE**

Committee on Appropriateness Criteria, Expert Panel on Radiation Oncology–Prostate Work Group

## **COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE**

*Panel Members:* Colleen A. Lawton, MD; Mack Roach III, MD; Mitchell S. Anscher, MD; David C. Beyer, MD; W. Robert Lee, MD; Gregory Merrick, MD; Jeff M. Michalski, MD, MBA; Alan Pollack, MD, PhD; Srinivasan Vijayakumar, MD; Peter R. Carroll, MD; Celestia S. Higano, MD; Peter M. Mauch, MD

## **FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST**

Not stated

## **GUIDELINE STATUS**

This is the current release of the guideline.

This guideline updates a previous version: McCormick B, Mendenhall NP, Shank BM, Haffty BG, Halberg FE, Martinez AA, McNeese MD, Mitchell SE, Rabinovitch RA, Solin LJ, Taylor ME, Singletary SE, Leibel S. Local regional recurrence and salvage surgery. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):1181-92.

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

## **GUIDELINE AVAILABILITY**

Electronic copies: Available in Portable Document Format (PDF) from the [American College of Radiology \(ACR\) Web site](#).

ACR Appropriateness Criteria® *Anytime, Anywhere*™ (PDA application). Available from the [ACR Web site](#).

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

## **AVAILABILITY OF COMPANION DOCUMENTS**

The following is available:

- ACR Appropriateness Criteria®. Background and development. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the [American College of Radiology \(ACR\) Web site](#).

## **PATIENT RESOURCES**

None available

## **NGC STATUS**

This NGC summary was completed by ECRI on September 5, 2006.

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